



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

tions of insects, The leaves and acorns of our common oaks, The life history of the toad (with a unique tail-piece), and The birds and I, are the titles of some of the leaflets.

T.

Elementary Science Bulletins of the Michigan Experiment Station, of which six have thus far been issued, dealing with Beans and peas before and after sprouting, Wheat and buckwheat before and after sprouting, Timothy and red clover before and after sprouting, Leaves of clovers at different times of day, Branches of sugar maple and beech as seen in winter, and Potatoes, rutabagas, and onions, are comparable with the *Teacher's Leaflets* of the Cornell Station. All of the series yet issued are by Professor Beal.

T.

Water-Lenticels. — In a recent number of the *Forstlich Naturwissenschaftliche Zeitschrift*, Tubeuf discusses the formation of water-lenticels and their significance. After a brief statement of some previous views as to the occurrence and function of ærenchyma tissue, he puts the following questions:

1. Is the development of water-lenticels due to the irritant influence of the liquid water surrounding the stem, and is their development above the water due to a transmitted stimulus?
2. Is their development due to lack of oxygen?
3. Is their development an ecological adaptation of woody plants living in moist localities, or is their occurrence a general one?

He concludes that their occurrence is not a peculiarity of plants in moist soils, but is a general attribute of woody stems. Furthermore, the lenticels formed whenever there was moisture; in other words, *liquid* water was not necessary, hence there is no such thing as transmitted stimulus.

He comes to no definite conclusion as to the relation between lack of oxygen and profuse formation of water-lenticels, but is inclined to regard the water as the potent factor. A number of figures accompany the paper, showing water-lenticels of *Sambucus*, *Ulmus*, and *Caragana*. It may be mentioned that water-lenticels and ærenchyma on branches of *Sambucus* and other woody plants were described and figured by von Schrenk in *Trans. Am. Micr. Soc.*, Vol. VII (1896), p. 98, Pls. I–III.

T.

Root-Tubercles of Alder. — The tubercles found on the roots of the alder and genera of the Eleagnaceæ were attributed by their discoverer, Woronin, to a fungus which he called *Schinzia alni*, and which

Brunchorst recently renamed *Frankia subtilis*. Frank regarded the peculiar cells always found in these tubercles as bodies of fungus origin, which had degenerated because of their mode of life within the cells of another plant. Moeller, on the other hand, regarded them as single-celled Hyphomycetes. From an extended series of experiments Hiltner¹ comes to the conclusion that *Frankia subtilis* is not a single-celled Hyphomycete, but a bacterial organism which possesses sporangia, and because of these and other peculiarities forms a connecting link between the bacteria and the true fungi. He succeeded in inoculating the organisms into roots of alder seedlings grown in N.-free nutritive solutions. The organisms enter through the root hairs in a manner similar to that of the organism causing leguminous tubercles. Inside of each hair is a mucilaginous thread in which the bacteria lie imbedded without any system or regularity. Before reaching the root proper the mucilaginous mass becomes filamentous and resembles mycelial threads. Within the root the mucilage masses resemble plasmodia, which extend from cell to cell, and ultimately become of a spongy consistency because of the appearance of numerous vacuoles, surrounded by thin walls of mucilage, in which the bacteria, now more or less in thread form, lie. Very soon after the formation of a tubercle the individual bacteria change into spheres filled with albumen, which rapidly differentiates into spores; in other words, the spheres represent sporangia. The spores germinate rapidly, forming short rods which fill the cells of the tubercle but develop no mucilage. Hiltner points out that, with the exception of *Bacillus erythrosporus*, few bacteria form sporangia. According to his view, the bacteroids of the leguminous tubercles must be regarded as sporangia, and in that case the bacteria of the alder and Leguminosæ, both forming plasmodia, constitute a new group of bacteria.

Numerous experiments have proven the fact that the organisms in the alder tubercles are capable of fixing atmospheric nitrogen; and, unlike those of the Leguminosæ, they are able to function fully under water. We are promised a full exposition of the subject in another journal at no distant date.

HERMANN VON SCHRENK.

The Red and Blue Coloring Matters of Flowers are discussed in *Natural Science* for February, by P. Q. Keegan, in continuation of a paper published in the same journal of December last. In view of

¹ Hiltner, L. On the Origin and Physiological Significance of Root-Tubercles. B. The Root-Tubercles of the Alders and Eleagnaceæ, *Forstlich Naturwissensch. Zeitschr.*, Bd. vii, p. 415, 1898.